Baxter Research Robot Face Control with Internal Buttons

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1. About the Project

In previous studies, we developed a Face System with emotions and face actions for Baxter Research Robot and we can control the situation of the Baxter's face publishing a String message to a determined topic, but controlling the Baxter's Face publishing a String message using terminal is not handy. Because of this reason user can set the Baxter's face and actions using controller. Also this situation increases the human robot interaction.

The aim of the project is to control the Face System of Baxter and Baxter's situation (enable, disable) with navigator buttons and wheels.

2. Technical Content

This project consists of one node named "control_physical.py". The node detects which button was pressed, and it decides the which face situation or action will be applicated.

There are several situations and actions that we can control the Baxter's face with buttons such as emotions, waking up, sleeping, following arms, enabling and disabling.

Waking up, sleeping, and following arms can be controlled with the navigator buttons which are on the Baxter's arm. In addition emotions can be controlled using the Wheel of left arm navigator.

If a user press any available button, program waits for 0.3 sec. because of avoiding from the same key's pression multiple time. Also, user can set the emotions using the navigator of left arm wheel. Wheels on the Baxter have 8 bits resolution (0-255), We can take data from the wheels as an integer between 0 and 255, we have 8 different emotions. Because of that reason, we divide the range into 8 (number of emotions) equal pieces.

Usage:

If we want to run this project, first of all, we have to be sure that Face System was already working. Then we can run "control_physical.py" node.

There are two navigators are used for controlling the Baxter Research Robot.(Left arm navigator, right arm navigator).

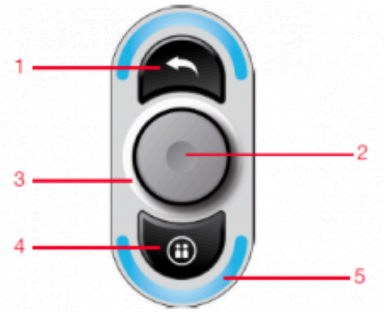

Figure [1]

Left navigator is the basic navigator for the robot's face and situation. Also you can provide with robot awake up pressing the button of number 1. On the other hand you can provide with the robot will sleep pressing the button of number 4. If you round the wheel (number 3), user can see the changes of emotions. Also, user can control the Baxter's situation (enable - disable) with number 2 buttons on both hands.

Right navigator can be also used for some controls of Baxter's face. There are three buttons to control the robot. First button and third button are used for opening and closing the dynamic arm following mode. Also button of number 2 can be used for robot's situation as the left hand's second button.

3. Result

Face system of Baxter Research Robot that we created in previous studies can be controlled in different ways. One of the practical way is using buttons on the robot. In this project, we tried to control the face system using those buttons. After the tests, we figured out that this kind of control of robot's face was accessible and practical.

4. Source Materials

[1]http://mfg.rethinkrobotics.com/wiki/Robot_Hardware